U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION TYPE CERTIFICATE DATA SHEET E00066EN	TCDS NUMBER: E00066EN REVISION: 4 DATE: April 25, 2019 ROLLS-ROYCE, Deutschland Ltd. & Co. KG MODELS: RB211 TRENT 553-61 RB211 TRENT 553A2-61 RB211 TRENT 556B-61 RB211 TRENT 556A2-61 RB211 TRENT 556-61 RB211 TRENT 556B2-61 RB211 TRENT 560-61 RB211 TRENT 560A2-61

Engines of models described herein conforming with this data sheet, (which is part of Type Certificate Number E00066EN), and other approved data on file with the Federal Aviation Administration, meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Federal aviation Regulations, provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other approved instructions.

TYPE CERTIFICATE (TC) HOLDER: Rolls-Royce, Deutschland Ltd. & Co. KG
Eschenweg 11, 15827 Blankenfelde-Mahlow, Germany

TYPE CERTIFICATE (TC) RECORD: Rolls-Royce, plc transferred TC E00066EN to
Rolls-Royce, Deutschland on February 21, 2019

1. MODELS	**RB211 Trent 553-61, 553A2-61**	**RB211 Trent 556-61, 556A2-61**	**RB211 Trent 556B-61, 556B2-61**	**RB211 Trent 560-61, 560A2-61**
TYPE	High by-pass turbofan (by-pass ratio of 8.5), axial flow, three-shaft. Single stage low pressure fan driven by a five stage turbine. Eight stage intermediate pressure compressor driven by a single stage turbine. Six stage high pressure compressor driven by a single stage turbine. Annular combustion chamber.			
RATINGS (See NOTE 1)				
Maximum Continuous (1)				
Thrust pounds at sea level static	44359	44359	44359	44359
Takeoff (5 minutes) (2)				
Thrust pounds at sea level static	55780	58462	58462 (3)	61902
Equivalent bare engine thrust	56655	59350	59350	62740
	(1) Flat rated to ISA +10ºC for all altitudes. (2) Flat rated to ISA +15ºC for all altitudes. (3) The Trent 556B-61 and 556B2-61 engines rated takeoff thrust is identical to the Trent 556-61 and 556A2-61engine at ISA sea level static conditions. The 556B-61 and 556B2-61 ratings provide increased thrust for takeoff at altitudes above sea level. The magnitude of this increased thrust varies with altitude, mach number and ambient temperature and provides the 560-61 and 560A2-61 ratings at 7341 feet and above.			

LEGEND: "- -" INDICATES "SAME AS PRECEDING MODEL"
"---" INDICATES "NOT APPLICABLE"
NOTE: SIGNIFICANT CHANGES ARE BLACK-LINED IN THE LEFT MARGIN.

1. MODELS (continued)	RB211 Trent 553-61, 553A2-61	RB211 Trent 556-61 556A2-61	RB211 Trent 556B-61 556B2-61	RB211 Trent 560-61 560A2-61
PRINCIPAL DIMENSIONS, inches				
Length				
From tip of spinner (minus rubber tip to tail bearing housing plug mount)	184.6	- -	- -	- -
Radius, maximum	66.5	- -	- -	- -
CENTER OF GRAVITY- complete powerplant				
Aft from powerplant station 100	27.1	- -	- -	- -
Below centerline	1.9	- -	- -	- -
Starboard from engine centerline	0.1	- -	- -	- -
CENTER OF GRAVITY- basic engine				
Aft from powerplant station 100	27.8	- -	- -	- -
Below centerline	2.2	- -	- -	- -
Starboard from engine centerline	0.2	- -	- -	- -
WEIGHT				
Dry powerplant	13797	- -	- -	- -
Basic engine	10930	- -	- -	- -
	Basic engine is the dry powerplant less nacelle, intake, cowl doors, CNA and thrust reverser.			
ENGINE PARTICULARS BUILD STANDARD	553-61: 2207 Issue 4	556-61: 2208 Issue 4	556B-61: 2225 Issue 4	560-61: 2209 Issue 4
RR Drawing Introduction Sheet (DIS)	553A2-61: 2230 Issue 1	556A2-61: 2231 Issue 1	556B2-61: 2232 Issue 1	560A2-61: 2233 Issue 1

FUELS	
APPROVED FUELS	See relevant Engine Operating Instructions for approved fuels.

OILS				
APPROVED OILS	See relevant Engine Operating Instructions for approved oils.			
OIL CONSUMPTION	1.32 U.S. pints/hour overall inflight maximum for unrestricted operation.			
OIL CAPACITY				
Nominal total system capacity	84.5 U.S. pints	- -	- -	- -
Nominal oil tank capacity	49.0 U.S. pints	- -	- -	- -
Minimum useable oil (including effect of attitude)	33.8 U.S. pints	- -	- -	- -

COMPONENTS	**RB211 Trent 553-61, 556-61, 556B-61, 560-61, 553A2-61, 556A2-61, 556B2-61, and 560A2-61**
ELECTRONIC FULL AUTHORITY FUEL	
Fuel control	TRWEECS 500-04
Fuel pump	TRWTPS 500MK2
Fuel metering unit	TRWHMU 500MK2
IGNITION SYSTEM	
Ignition system plugs	Federal Mogul CH34761
Ignition system units	Unison 430154
EQUIPMENT	For identification of equipment approved for use on these engines, refer to Chapter 1 of appropriate Rolls-Royce Drawing Introduction Sheet (DIS)

CERTIFICATION BASIS	FAR 21.29 and FAR 33 effective February 1, 1965, as amended by FAR 33-1 through 33-19. Pursuant to FAR21.29(a)(1)(ii), the Type Certificate was issued in validation of the British Civil Aviation Authority Certification Standards JAR-E change 9 plus OP E/96/1 and E/97/1, which was found to provide a level of safety equivalent to that provided by FAR 33, Amendment 33-19.

MODEL	APPLICATION DATE	ISSUED/ REVISED	SURRENDERED
RB211 TRENT 553-61	MAY 20, 1998	November 20, 2001	
RB211 TRENT 556-61	MAY 20, 1998	November 20, 2001	
RB211 TRENT 556B-61	JAN 25, 2000	November 20, 2001	
RB211 TRENT 560-61	MAY 20, 1998	November 20, 2001	
RB211 TRENT 553A2-61	January 3, 2003	September 16, 2003	
RB211 TRENT 556A2-61	January 3, 2003	September 16, 2003	
RB211 TRENT 556B2-61	January 3, 2003	September 16, 2003	
RB211 TRENT 560A2-61	January 3, 2003	September 16, 2003	

The aviation authority for the United Kingdom, the UK Civil Aviation Authority (CAA), originally type certificated this engine. The FAA validated this product under U.S. Type Certificate Number E00066NE. Effective September 28, 2003, the European Aviation Safety Agency (EASA) began oversight of this product on behalf of the UK.

IMPORT REQUIREMENTS	To be considered eligible for installation on U.S. registered aircraft, each new engine to be exported to the United States with UK CAA or EASA airworthiness approval shall have a Joint Aviation Authorities (JAA) or EASA Form 1, Authorized Release Certificate. The JAA or EASA Form 1 should state that the engine conforms to the type design approved under the U.S. Type Certificate E0066NE, is in a condition for safe operation and has undergone a final operational check. Additional guidance is contained in FAA Advisory Circular 21-23, "Airworthiness Certification of Civil Aircraft, Engines, Propellers, and Related Products Imported into the United States."

N O T E S

NOTE 1. The engine ratings are based on static test stand operation under the following A & B conditions:

A.

(1) Compressor inlet air at 59ºF and 29.92 Hg.
(2) No aircraft accessory loads or optional air extraction.
(3) 100% air intake recovery corrected from the datum air intake system defined by drawing ATF 16471 or approved alternatives.
(4) Engine exhaust system defined by Common Nozzle Assembly RX95432-7 and Spacer Ring RX95425
(5) Turbine gas temperature and rotor speed limitations are not exceeded.

B. Equivalent Bare Engine Thrust (LBF)
The equivalent bare thrust (lbf) is rated thrust excluding the losses of propulsion fan duct And thrust reverser and jet pipe washed by the fan stream.

NOTE 2. MAXIMUM PERMISSIBLE ENGINE ROTOR SPEEDS (%)

100% HP = 13,300 RPM
100% IP = 9,100 RPM
100% LP = 3,900 RPM

Maximum takeoff (5 minutes) (See NOTE 18)

HP	97.4 %
IP	99.4 %
LP	92.5 %

NOTE 2. (continued) Maximum overspeed (20 seconds)

HP	(non-declared)
IP	(non-declared)
LP	(non-declared)

Maximum reverse thrust (30 seconds)

LP	69.0%

NOTE 3. MAXIMUM PERMISSIBLE TEMPERATURES

TURBINE GAS TEMPERATURE (TGT) ºC

Starting

Below 50% N3 (ground starting)	700 max. during start or relight
Below 50% N3 (inflight starting)	850
Above 50% N3	850
Takeoff (5 minutes)	900 may be used up to 10 minutes in the event of engine failure
Maximum continuous (unrestricted)	850
Overtemperature (20 seconds)	920

Oil

Combined scavenge temperature (ºC)

Minimum for starting		
	for engines incorporating Modification Bulletin 79-E065	-40
	for engines incorporating Modification Bulletin 79-D327	-20
Minimum for opening up	20	
Maximum for unrestricted use	196	

NOTE 4. FUEL AND OIL PRESSURE LIMITS

Fuel

MINIMUM FUEL PRESSURE

Between sea-level and 41,000 feet, not less than 5 psig plus true fuel vapor pressure, measured at inlet to engine LP fuel pump.

Oil

Minimum oil pressure

Ground idle to 70% HP rpm	25 psig
Above 95% HP rpm	40 psig

NOTE 5. MAXIMUM PERMISSIBLE COMPRESSOR AIR BLEEDS

Air delivery for aircraft services, excluding powerplant anti-icing. The air is automatically scheduled from the engine HP stage 1 and HP stage 6 compressor bleed ports via two valves in the aircraft ducting, which select the appropriate supply in response to signals sensing HP compressor delivery pressure (P30) together with a synthesized HP compressor delivery temperature (T30Syn).

With valve controller 6853A020000X5 the switchover from the HP6 to the HP1 compressor delivery port occurs at engine power settings where the following conditions are met:

A. Out of icing conditions: When both the HPC delivery static pressure (P30S) is greater than (105 psi ± 5) gauge.

B. In icing conditions: When both the HPC delivery pressure (P30S) reaches 130 psi ± 5) gauge and the HPC delivery temperature (T30syn) reaches 375ºC ± 5ºC.

NOTE 5. (Cont'd)

Maximum HP6 bleed (% of gas generator compressor flow); this bleed decreases linearly between the values listed below for the low idle and switchover points.

A.	Normal operation:	
	(1) Low Idle and up to 1190ºk TET	9.5
	(2) At switchover point	4.0
B.	Abnormal (one engine inoperative):	
	(1) Low idle and up to 1210ºk TET	16.25
	(2) At 1400K TET	7.7
	(3) At switchover point	4.6

Maximum HP1 bleed (4 of gas generator compressor flow); this bleed (HP1) decreases linearly between the values listed below for the switchover and 1700ºk TET.

A.	Normal operation:	
	(1) At switchover point	4.0
	(2) Up to1700ºk TET	1.0
	(3) At takeoff	1.0
B.	Abnormal (one engine inoperative):	
	(1) At switchover point	7.0
	(2) Up to 1700ºk TET	2.0
	(3) At takeoff	2.0

Maximum LP bleed (% of fan flow)

A.	Normal and Abnormal (one engine inoperative):	
	(1) From low idle and up to 1130ºk TET	.53
	(2) Above 1650ºk TET	0.25

Maximum HP3 bleed for powerplant anti-icing (% of HPC inlet flow); this bleed decreases linearly between the values listed below for the1000ºk TET and 1600ºk TET points.

A.	Normal and Abnormal (one engine inoperative):	
	(1) From low idle to 1000ºk TET	1.75%
	(2) At 1600ºk TET and up to takeoff	1.5%

NOTE 6. SHAFT POWER EXTRACTION LIMITATIONS

Accessory drive provisions (continuous power as listed may be extracted under all engine operating conditions)

MODELS	DRIVE	ROTATION (AS VIEWED FROM GEARBOX)	SPEED RATIO TO HP ROTOR SPEED	TORQUE (lb. - in.)		
				CONTINUOUS	MAXIMUM INSTANTANEOUS	OVERHANG (in. - lb.)
ALL MODELS	STARTER	CW*	.7967		6360	290
	IDG	CW	.6807	2200	4505	1300
	HYDRAULIC PUMP	CW	.3744	1500	2000	183

* CW = CLOCKWISE
CCW = COUNTERCLOCKWISE

Max starter torque at 0ft varies with air temperature as follows:

Air temperature	Max torque (lb. - in,)
-54	6084
-40	6077
ISA	5980

NOTE 7. The Full Authority Digital Engine Controller controls power settings.

NOTE 8. Life limited parts are identified in the Engine manual.

NOTE 9. This engine approval includes bare engine plus engine accessories, coolers, filters, harness, and instrumentation transmitters as defined in the appropriate RR DIS. Hydraulic pumps and IDG are aircraft supply.

NOTE 10. RB211 series manuals under CAA requirements accepted as equivalent to FAR 33.4 and FAR 33.5 requirements are:

MODEL RB211-	OPERATING INSTRUCTIONS	MAINTENANCE MANUAL	INSTALLATION MANUAL	ENGINE MANUAL
TRENT 553-61	OI - TRENT - A340	M - TRENT - A340	DNS 62612	E - TRENT - A340
TRENT 556-61	OI - TRENT - A340	M - TRENT - A340	DNS 62612	E - TRENT - A340
TRENT 556B-61	OI - TRENT - A340	M - TRENT - A340	DNS 62612	E - TRENT - A340
TRENT 560-61	OI - TRENT - A340	M - TRENT - A340	DNS 62612	E - TRENT - A340
TRENT 553A2-61	OI - TRENT - A340	M - TRENT - A340	DNS 62612	E - TRENT - A340
TRENT 556A2-61	OI - TRENT - A340	M - TRENT - A340	DNS 62612	E - TRENT - A340
TRENT 556B2-61	OI - TRENT - A340	M - TRENT - A340	DNS 62612	E - TRENT - A340
TRENT 560A2-61	OI - TRENT - A340	M - TRENT - A340	DNS 62612	E - TRENT - A340

Each of the documents listed below must state that it is approved by the European Aviation Safety Agency (EASA) or, for approvals made before September 28, 2003 by the United Kingdom Civil Aviation Authority. Any such documents including those approved under a delegated authority, are accepted by the FAA and are considered FAA approved.

- Service bulletins,
- Structural repair manuals,
- Vendor manuals,
- Aircraft flight manuals, and
- Overhaul and maintenance manuals.
- Technical Variances

These approvals pertain to the type design only.

NOTE 11. These engines meet the smoke and gaseous emission requirements of Part 34.

NOTE 12. The engine is fitted with a Digital Electronic Engine Fuel Control system in which the software meets the "critical" standard of RTCA DO-178B.

NOTE 13. In icing conditions, the engine may be operated satisfactorily at LP rotor speeds (N1) down to low idle. Minimum corresponding N1 at low idle for these engines is 17.6 percent in flight and 15.4 percent for ground running.

NOTE 14. These engines are fitted with an independent IP and LP spool overspeed governor. Dispatch with this item unserviceable is not permitted.

NOTE 15. These engines satisfy the certification base as defined in this Data Sheet when operating with the FADEC in reversionary control mode.

NOTE 16. VARIANTS

RB211 TRENT 553-61	Basic model.
RB211 TRENT 556-61 and 560-61	Same as basic model except for increased takeoff thrust rating.
RB211 TRENT 556B-61	Same as 556-61 model except for increased takeoff thrust ratings at altitude.
RB211 TRENT 553A2-61	A derivative of the RB211 TRENT 553-61 with improved fuel consumption.
RB211 TRENT 556A2-61	A derivative of the RB211 TRENT 556-61 with improved fuel consumption.
RB211 TRENT 556B2-61	A derivative of the RB211 TRENT 556B-61 with improved fuel consumption.
RB211 TRENT 560A2-61	A derivatiave of the RB211 TRENT 560-61 with improved fuel consumption.

NOTE 17. The RB211 TRENT 500 series engines have been approved to operate with certain faults present in the control system, based on satisfaction of FAR 33 requirements and appropriate FAR 25 control system reliability requirements.

The following criteria exist as dispatch and maintenance requirements for the engine control system.

Fault Class 1 Level A:	No dispatch allowed
Fault Class 1 Level B:	Dispatchable; maximum operating interval for Fault Class 1 Level B fault(s) is 300 operating hours
Fault Class 2:	Dispatchable; maximum operating interval for Fault Class 2 fault(s) is 500 operating hours

Fault levels Class 1 and 2 constitute Rolls-Royce nomenclature. The airframe manufacturers may use different nomenclature in adapting these fault categories to the aircraft maintenance and display systems; however, the maximum operating intervals are restricted as shown above.

NOTE 18. The takeoff rating and its associated operating limitations may be used for up to 10 minutes in the event of engine out contingency, but their use is otherwise limited to no more than 5 minutes.

---END---